

**Abstract**

The invention provides methods and apparatus for multiple user detection (MUD) processing that have application, for example, in improving the capacity CDMA and other wireless base stations. One aspect of the invention provides a multiprocessor, multiuser detection system for detecting user transmitted symbols in CDMA short-code spectrum waveforms. A first processing element generates a matrix (hereinafter, "gamma matrix") that represents a correlation between a short-code associated with one user and those associated with one or more other users. A set of second processing elements generates, e.g., from the gamma matrix, a matrix (hereinafter, "R-matrix") that represents cross-correlations among user waveforms based on their amplitudes and time lags. A third processing element produces estimates of the user transmitted symbols as a function of the R-matrix.